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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/563,932	01/09/2006	Antonius Johannes Maria Nellissen	NL030856	3346
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			EXAMINER HINDENLANG, ALISON L	
			ART UNIT 1791	PAPER NUMBER
			MAIL DATE 07/21/2009	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/563,932

Applicant(s)

NELLISSIN ET AL.

Examiner

ALISON HINDENLANG

Art Unit

1791

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
3. Examiner wishes to point out to applicant that claims 16 and 10-15 are directed towards an apparatus and as such will be examined under such conditions. The material worked upon or the process of using the apparatus are viewed as recitation of intended use and are given no patentable weight (Please see MPEP 2114 R1-2115 R2 for further details).
4. Claims 16 and 10-12, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harchanko (WO 2004/039554) further in view of Jones (US 4909818) and optionally in view of Afromowitz (US 2002/0006588).

Art Unit: 1791

5. With respect to claim 16, Harchanko teaches:

A device for exposing, to a predetermined pattern of exposure radiation during a predetermined time, a photoresist layer on a mold surface of a mold having a base shape, ("lithographic method for forming mold inserts and molds", title) the device comprising:

a radiation source for emitting UV radiation ("illumination source 140", column 5, lines 26-27, figure 1),

...

a spatial light modulator configured to impart to the exposure beam a radiation distribution according to the predetermined pattern ("the gray scale mask 130", column 5, line 27, figure 1 – "an electronic gray-scale mask may be used, for example an array of liquid crystal display ("LCD") cells or comparable spatial light modulators", column 9, lines 16-18) and render the photoresist layer developable to selectively remove photoresist material according to the radiation pattern and shape the exposed surface of the layer to a required end shape of the mold, and ("In the case in which a negative photoresist-like method is used, the material is exposed by passing illumination 150, which may, for example, be ultra-violet light, from an illumination source 140 through the gray-scale mask 130 and the through the blank 110. The illumination passes through the blank 100 and into material 120 developing the material 190 depending upon the penetration depth 170 determined by gray-scale mask 130", column 5, lines 24-30)

a mold holder arranged in the path of the radiation from the spatial light modulator for holding the mold to be exposed ("the blank 110 and radiation-curable material 120 are loaded onto a fixture that sets the position of the substrate relative to a gray-scale mask 130", column 5, lines 21-22),

wherein the base shape of the mold is configured to be modified to obtain the required end shape of the mold surface ("curing produces a developed, radiation-curable material 190 with a surface 160 having the desired configuration", column 6, lines 5-6)...

Harchanko does not teach:

optical means for concentrating the emitted radiation in an exposure beam into a photolithographic process,

further in response to a hot flow development wherein (i) the mold with the exposed patterned photoresist layer is heated to a predetermined temperature to make unexposed photoresist of the exposed patterned photoresist layer fluid and (ii) fast spinning the mold to remove the fluid unexposed photoresist

In the same field of endeavor, light projection systems, Jones teaches a "beam profiler 14" (column 2, lines 29-30, figure 1) including "a positive cylindrical lens 16 to

recollimate light from lens 15" (column 2, lines 42-43, figure 1) for the purpose of providing "a profiled beam 17 of more uniform symmetrical intensity than the laser output beam 13" (column 2, lines 44-45). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus taught by Harchanko by adding a beam profiler as taught by Jones for the purpose of providing a more symmetrical exposure beam.

Though the mold and its intended use are not considered part of the claimed apparatus the teachings of Afromowitz are optionally provided should the applicant choose to argue that the combination of Harchanko and Jones does not obviate the use of such a mold or method.

In the same field of endeavor, processing of photoresist materials, Afromowitz teaches a "hot spin development" (paragraph 0054) in which the exposed substrate is "placed on a spinner and heated" (paragraph 0054) for the purpose of removing the unpolymerized resist material (paragraph 0055). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus as taught above to be capable of hot spin development as taught by Afromowitz for the purpose of removing unpolymerized resist material.

6. With respect to claim 10, Harchanko further teaches:

wherein the spatial light modulator is a liquid crystal display (LCD) ("and electronic gray scale mask may be used, for example an array of liquid crystal display ("LCD") cells, or comparable spatial light modulators", column 9, lines 17-18), digital mirror device or deformable mirror device ("alternatively, modulation may be carried out using a adaptive mirror to generate a wavefront the intensity of which is modulated across its surface...using a discrete array of mirrors to deflect the light", column 10, lines 9-13).

7. With respect to claim 11, Harchanko teaches:

Art Unit: 1791

wherein an optical projection system is arranged between the spatial light modulator and the mold holder. ("the lens residing between the mask and the substrate", column 10, lines 23-24)

8. With respect to claim 12, Harchanko, in the primary embodiment illustrated by figure 1, does not teach "an optical projection system" thus it would have been obvious to one of ordinary skill in the art at the time of the invention that in the system taught by Harchanko "the mold holder and the spatial light modulator are arranged close to each other" as claimed.

9. With respect to claim 14, Harchanko teaches:

wherein the mold holder is arranged at such distance from the projection system that the photoresist layer on the mold to be exposed is outside the focus plane of the projection system. ("the lens residing between the mask and the substrate may be defocused", column 10, lines 23-24)

10. Claims 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Harchanko (WO 2004/039554), Jones (US 4909818), and optionally Afromowitz (US 2002/0006588) as applied to claim 16 above, and further in view of MacKinnon (US 2002/0135763).

11. With respect to claim 13, the combination of Harchanko, Jones, and Afromowitz does not teach:

wherein a diffuser element is arranged in the path of the exposure beam between the spatial light modulator and the mold holder.

In the same field of endeavor, light projection systems, MacKinnon teaches "the embodiment shown comprises a spectral recombiner comprising a direction diffuser" (paragraph 0055, figure 4) the light from which "then passes a projection system 72" (paragraph 0055, figure 4) for the purpose of projecting the beam in a particular

direction (paragraph 0063). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the light projection system taught by the combination of Harchanko, Jones, and Afromowitz for the purpose of projecting the light beam in a specific direction.

12. With respect to claim 15, MacKinnon further teaches "SLM 16 is operably connected to at least one controller 44 that contains computer-implemented programming" (paragraph 0049, figure 4) for the purpose of controlling "the on/off pattern of the pixels" (paragraph 0049).

Response to Arguments

13. Applicant argues that the previous combination of references was improper because it did not meet all the limitations of the claim 16 as amended and further more that the Jones (US 4909818) teaches away the "concentrating" limitation.

14. Examiner considered the argument regarding teaching away to be non-persuasive because Jones teaches "the beam profiler 14 **may** include a negative cylindrical lens 15" (column2, lines 40-41) (emphasis added). Further more as applied above Jones teaches that the beam profiler may also include "a positive cylindrical lens 16 to recollimate light from lens 15" (column 2, lines 42-43, figure 1). Examiner understands this to mean that the expanded out put beam is concentrated into the more uniform profiled beam 17. Additionally the use of the word "may" means that other types of lenses could be included in the beam profiler and as such Jones can not be considered teaching away.

15. Examiner considers the argument regarding the fact that the rejection of the first office action did not teach all the parts of the amended claim moot in light of the fact that neither the mold nor its intended use gives patentable weight to the apparatus of claim 16. However a new rejection optionally in light of Afromowitz (US 2002/0006588) as applied above covers all the added limitations of the claim.
16. Further arguments that dependent claims 10-15 are allowable as being dependent from an allowable claim 16 are moot in light of the new rejection of claim 16.

Conclusion

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALISON HINDENLANG whose telephone number is (571) 270-7001. The examiner can normally be reached on Monday to Thursday 7:30 - 5 pm; Every other Friday 7:30 - 4 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Philip Tucker can be reached on 571-272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ALH

/Philip C Tucker/

Supervisory Patent Examiner, Art Unit 1791